SM 3H

Review for Test 1.1-1.8

2017-2018

Name _____ Date _____ Period _____

Describe the end behavior of each polynomial using limit notation, without using a graphing calculator.

1. $f(x)=(x+3)(x-1)(2x-5)$

2. $f(x)=-(x+4)^2(x-2)$

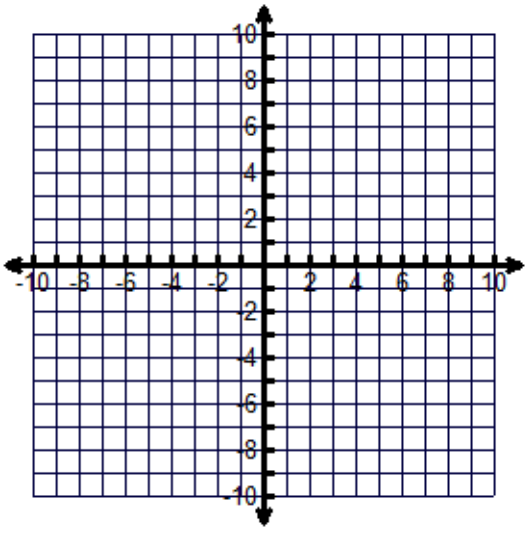
3. $f(x)=-2x^3-3x^2+36x-58$

4. $f(x)=3x^4-7x^3+16x^2-15x+65$

State the degree and list the zeros of the polynomial. State the multiplicity of each zero and determine whether the graph crosses or touches the x-axis at the corresponding x-intercept. Then sketch a graph.

5. $f(x)=-2x^3(x+8)$ Degree: _____

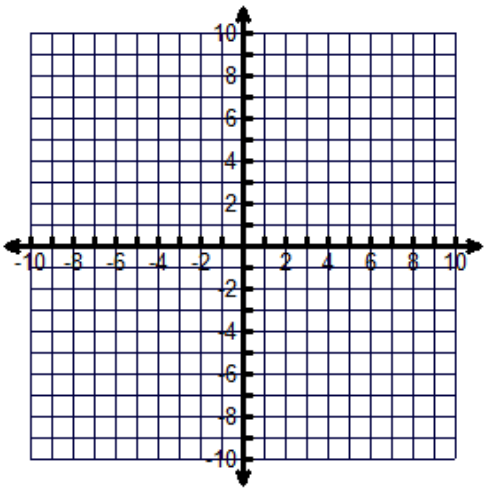
Zero	Multiplicity	Touch/Cross



$\lim_{x\to-\infty} f(x)=$ $\lim_{x\to+\infty} f(x)=$

6. $f(x)=(x+1)^2(x-5)^3(x+3)^2$ Degree: _____

Zero	Multiplicity	Touch/Cross



$\lim_{x\to-\infty} f(x)=$ $\lim_{x\to+\infty} f(x)=$

Multiply the expression using the polynomial identities.

7. $(3x+2y)^2$

8. $(x-2y)^3$

9. $(x-4)(x+6)$

10. $(5x+i)(5x-i)$

Factor the expressions using the polynomial identities.

11. $25x^2-64$

12. x^3+125

13. $x^2-4x-21$

14. $9x^2+81$

Use the quadratic formula to solve each equation. Show work!

15. $x^2 - 17x = -72$

16. $5x^2 - 3x + 1 = 0$

Simplify the expression. Show work!

17. $(x+5)(2x-1) - (3x^2 - 16x + 3)$

Divide *f(x)* by *d(x)* using long division. *W*rite answer in fraction form. According to the Factor Theorem, is $d(x)$ a factor of $f(x)$? Show work!

18. $f(x) = 2x^3 - 3x^2 + 4x - 8, \quad d(x) = x - 1$ Yes or No

Divide using synthetic division. Write answer in fraction form. Show work!

19. $\dfrac{2x^3 + 3x^2 + 4x - 10}{x + 1}$

Write an equation in factored form and standard form for the function with the given zeros. Show work!

20. $x=3,\ x=-5,\ x=0$

Factored Form: _____

Standard Form: _____

Factor to find the zeros of each of the following polynomials.

21. $f(x)=x^3+4x^2+3x$

22. $f(x)=x^2-6x-16$

Use the Rational Zeros Theorem to write a list of all potential rational zeros. Show work!

22. $f(x)=3x^3+43x^2+43x+27$

Using the given zero, find all of the zeros and write a factored form of *f(x)*. Show work!

23. $3i,$ is a zero of $f(x)=x^4-x^3+7x^2-9x-18$

Write a polynomial function of minimum degree in standard form with real coefficients whose zeros include those listed. Show work!

24. $x=-2,\ x=1+2i$

25. Use Descartes's Rule of Signs to determine the possible number of positive and negative real zeros of the polynomial function. Hint: Use *f*(*x*) to find number of positives and *f*(-*x*) to find number of negatives.

$f(x)=-x^2-5x-8$

Number of possible positive zeros: _____

$f(-x)=$ _____

Number of possible negative zeros: _____

26. Find all of the real zeros of the function, finding exact values whenever possible. Identify each zero as rational or irrational. Show work!

$f(x)=x^3+x^2-2x-2$

Zeros	Rational/Irrational

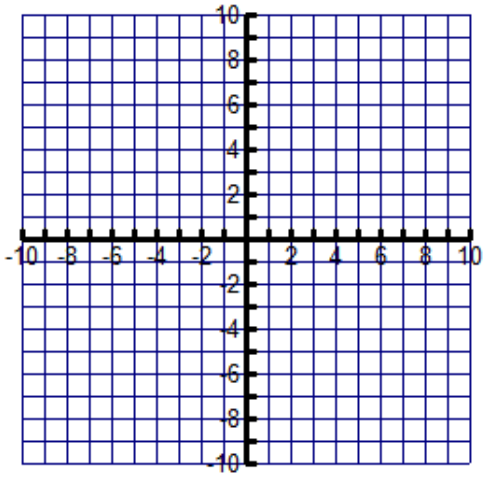
27. Write a polynomial function of minimum degree in <u>factored form</u> with real coefficients whose zeros and their multiplicities include those listed. Find the <u>degree of the polynomial</u>, the <u>*x*-intercepts</u>, <u>end behaviors</u> (using limit notation) and <u>sketch the graph.</u> Show work!

leading coefficient: -3

$x = 0$ (multiplicity 1)

$x = 2$ (multiplicity of 2),

$x = -1$ (multiplicity of 1)



Factored form: _____

Degree: _____

End behaviors (write using limit notation):

_____

x-intercepts (write as ordered pair): _____